



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,252	07/31/2003	Gerard Chauvel	TI-35430 (1962-05409)	1620
23494	7590	10/11/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			GU, SHAWN X	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	
			2189	

DATE MAILED: 10/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

He

Office Action Summary

Application No.

10/631,252

Applicant(s)

CHAUVEL ET AL.

Examiner

Shawn Gu

Art Unit

2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2003 and 02 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/31/03, 3/15/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d) and domestic priority under 35 U.S.C. 119(e).

Claims 1-17 are pending.

Receipt is acknowledged of papers filed under 35 U.S.C. 119 (a)-(d) based on an application filed in European Patent Office on 30 July 2003. Applicant has not complied with the requirements of 37 CFR 1.63(c), since the oath, declaration or application data sheet does not acknowledge the filing of any foreign application. A new oath, declaration or application data sheet is required in the body of which the present application should be identified by application number and filing date.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 31 July 2003 and 15 March 2004 were filed after the mailing date of the application on 31 July 2003. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Claim Objections

Claim 4 is objected to because of the following informalities: the term "of" should appear between the terms "type" and "data" to read as "type of data". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As for claim 2, the term "substantially" is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 9 and 11-16 are rejected under U.S.C. 102(b) as being anticipated by Baum et al. [4,928,239].

As for claims 1 and 11, Baum et al. discloses a system or a method of managing memory, comprising:

- a processor (Fig 1, Processor 19);
- a memory coupled to the processor (Fig 1, Cache 21 and Main Memory 13);
- a stack that exists in memory and contains stack data (Fig 4, 47; Col 5, Lines 48-60);
- a memory controller coupled to the memory (Fig 3, Cache Control and Replacement Control; Col 5, Lines 19-27, handling Cache Control Specifier also implies the existence of a memory controller coupled to the memory);
- wherein the processor issues data requests (Fig 3, Instruction 41; Col 5, Lines 19-23); and
- wherein the memory controller adjusts memory management policies based on whether the data requests refer to stack data (Col 5, Lines 28-68 – Col 6, Line 16).

As for claim 2, Baum et al. further discloses the memory comprises a first level of memory (Fig 1, Cache 21) and a second level of memory (Fig 1, Main Memory 13), and

Art Unit: 2189

the first level of memory is substantially faster than the second level of memory (Col 1, Lines 38-45; Col 4, Lines 20-28).

As for claim 3, Baum et al. further discloses the first level of memory comprises a cache memory (Fig 1, Cache 21) that implements a cache allocation policy, and the cache allocation policy is adjusted based on the type of data access requested (Col 5, Lines 20-27).

As for claim 4, Baum et al. further discloses the allocation policy is adjusted when the type of data access refers to stack data (Col 5, Lines 37-42; Col 5, Lines 48-68) that corresponds to a predetermined word (Col 5, Lines 62-63) in a cache line (Col 5, Lines 62-63; Col 4, Lines 46-50) and the cache line is not present in the cache memory (Col 5, Line 63).

As for claims 5 and 6, Baum et al. further discloses the type of data request involves writing to the stack (Col 5, Lines 62-63), and adjusting the memory management policies includes allocating the cache line containing stack data within the cache memory (Col 5, Lines 63-64), and updating the stack data within the cache line without fetching data from the secondary memory (Col 5, Lines 64-68).

As for claim 7, Baum et al. further discloses the type of data request involves reading from the stack (Col 6, Lines 5-6).

As for claims 9 and 15, Baum et al. further discloses the predetermined word is the first word in the cache line (Col 5, Lines 62-63).

As for claim 12, Baum et al. further discloses the method comprises determining if the requested data corresponds to a predetermined word in a cache line in a cache memory (Col 5, Lines 20-32; Col 5, Lines 62-63).

As for claim 13, Baum et al. further discloses the method comprises determining whether the request for data is a write request or a read request (Col 5, Lines 62-63; Col 6, Lines 5-6).

As for claim 14, Baum et al. further discloses the request for data is a write request for stack data (Col 5, Lines 62-63) and the method further comprises writing data to the cache line without fetching data from a main memory (Col 5, Lines 64-68).

As for claim 16, Baum et al. further discloses enabling a valid bit associated with the cache line (Col 4, Lines 59-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et al., further in view of Damron et al. [US 6,578,111 B1].

As for claims 8 and 17, Baum et al. further discloses the type of data request involves reading from the stack (Col 6, Lines 5-6), and forwarding the stack data from the secondary memory (Col 6, Lines 8-9; Col 5, Lines 9-14), but fails to teach that adjusting the memory management policies includes not allocating the cache line containing stack data within the cache memory. However, Damron et al. discloses a similar cache memory system and method wherein cache line containing stack data (Col 4, Lines 40-45; Col 11, Lines 20-23) is not allocated (Col 9, Lines 12-14) to a cache memory (Fig 3A, Victim Cache 155) due to the access pattern and access frequency of stack data (Col 4, Lines 40-52), in order to improve cache miss rate and system operation speed (Col 9, Lines 15-20). Therefore, it would have been obvious to one ordinarily skilled in the art at the time of the applicant's invention that Baum et al.'s system and method can implement such memory management policy feature for cache lines containing stack data to improve cache miss rate and system operational speed.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et al.

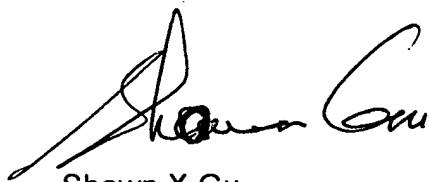
As for claim 10, Baum et al. does not teach specifically that the predetermined word is the last word in the cache line. However, Baum et al. discloses that the predetermined word is the first word in the cache line as described above in claim 9, and the first word in the cache line is the word with the highest address (or the lowest address depending on the processor's design) in the cache line (Fig 4). It would have been obvious to one ordinarily skilled in the art at the time of the applicant's invention that the stack growth direction (which is a ordering method of storing data) is up to the system's design decisions much like choosing between the byte ordering methods of Little Endian and Big Endian in a processor's design, and if the stack growth direction in Baum et al's system is reversed due to the system's design change, then the word with the highest address (or the lowest address depending on the processor's design) would become the last word in the cache line instead.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Gu whose telephone number is (571) 272-0703. The examiner can normally be reached on 9am-5pm, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571)272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shawn X Gu
Assistant Examiner
Art Unit 2189

27 September 2005



KEVIN VERBRUGGE
PRIMARY EXAMINER